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09/715,164	11/20/2000	Takashi Touma	Q61753	6871

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EXAMINER

MOE, AUNG SOE

ART UNIT PAPER NUMBER

2612

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/715,164

Applicant(s)

TOUMA ET AL.

Examiner

Aung S. Moe

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☒ Claim(s) 12-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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3. Claim 1, 3, 4, 5, 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham et al. (U.S. 5,300,960) in view of Murayama et al. (U.S. 6,130,700).

Regarding claim 1, Pham '960 discloses a drive method for an optical printer (Figs. 1 and 2) that drives a plurality of light emitting elements to emit light in accordance with image data (i.e., noted that the LED array 20 drive in accordance with the image data; see col. 1, lines 20+ and col. 3, lines 1+), for recording pixels of different densities on a photosensitive recording medium (12) to form a grayscale image (i.e., col. 1, lines 55+, col. 2, lines 10+ and col. 4, lines 25+), the method comprising the steps of:

controlling time lengths of lighting the individual light emitting elements in accordance with tonal levels (i.e., the gray levels) of pixels to print that are represented by the image data (i.e., noted from Fig. 3-9 that the control unit 31 is capable of controlling time lengths of the LED array in accordance with the gray levels of pixels to print that are represented by the image data; col. 4, lines 30+, col. 5, lines 1+ and col. 6, lines 5+); and

**simultaneously changing luminance of the respective light emitting elements (i.e., the LED array 20) according a predetermined characteristic curve (i.e., noted the use of curves as shown in Figs. 4-9) (i.e., as shown in Figs. 3-9 and further discussed in col. 2, lines 14+ and col. 9, lines 10+ that the control unit 31 is capable of simultaneously changing the luminance of the respective LED elements with a respective predetermined characteristic curve as shown in Figs. 4-9).**

However, it is noted that Pham '960 does not explicitly stated varying the brightness for the light emitting elements during the exposure time (i.e., changing luminance of the respective

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light emitting elements as the lighting/exposure time for each pixel elapses) as set forth in the present claimed invention.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Murayama '700. In particular, Murayama '700 teaches the use of an exposure control unit (i.e., see Figs. 4 and 6, the elements 20 and 25; see col. 17, lines 10+) for controlling time length of lighting the individual light emitting elements (i.e., LED1-LED4) in accordance with tonal level (i.e., noted the time length of lighting each of the LED1-LED4 is cyclically increased or decreased by different level based on the tonal level as shown in Figs. 10 and 11; see col. 18, lines 60+) and simultaneously changing luminance of the respective light emitting elements (i.e., noted that light emitting elements LED1-LED4 are simultaneously strikes each dot; see col. 18, lines 35+) according a predetermined characteristic curve (i.e., Fig. 11) as the lighting time (i.e., the exposure time) for each pixel (i.e., each dot) elapses (i.e., as shown in Figs. 6 and 9-11, the brightness for the light emitting elements LED1-LED4 is changed by varying the exposure duration by a different levels based on the lower two bits of the gradation data during the exposure time; see col. 18, lines 5-25+). In view of this, it would prevent uneven color development in a printed image and therefore prevents deterioration of image quality (i.e., see col. 19, lines 10-15).

In view of the above, having the system of Pham '960 and then given the well-established teaching of Murayama '700, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Pham '960 varying the brightness for the light emitting elements during the exposure time as taught by Murayama '700, since

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Murayama '700 stated in col. 19, lines 10+ such a modification would prevent uneven color development in a printed image and therefore prevents deterioration of image quality.

Regarding claim 3, the combination of Pham '960 and Murayama '700 discloses wherein the luminance of the light emitting elements (i.e., the LEDs of Pham '960 and Murayama '700) is changed with time at a constant rate (i.e., noted from Figs. 4, 6, 7, and 9, the exposure time generated by the luminance of the LED elements are changed with time at a constant rate; see col. 7, line 25-col. 8, lines 20+ of Pham '960; and noted from Fig. 11 of Murayama '700 also shows varying of luminance of LED1-LED4 with time at a constant rate) from a constant initial value for each pixel (i.e., noted the initial value is provide by the counter 30 for each pixel; see col. 8, lines 15-50 of Pham '960; and noted from Figs. 6 and 10-11, the constant initial value is provided by the CPU 25 and memory 27; see col. 13, lines 15+), whereas a lighting time length (i.e., the exposure time length, such that pulse X, Y and Z, as shown in Fig. 3 of Pham '960; and noted the lighting time of LEDs as shown in Fig. 10; see col. 18, lines 45-68 of Murayama '700) for each tonal level (i.e., the gray level 1-15 of Pham '960 and the gradation level of Murayama '700 as shown in Fig. 11) is determined by the initial value (i.e., the initial count value provided by the counter 30 of Pham '960; and the value provided by the counters 55 form the elements 25 and 27 as shown in Figs. 4 and 6 of Murayama '700) and changing rate of the luminance of the light emitting elements (i.e., noted the rate of pulse changes as shown in Fig. 3 of Pham '960; and noted the changing rate corresponding to a gradation data respect to the exposure time as shown in Figs. 10 and 11 of Murayama '700) and coloring characteristics of the photosensitive recording medium (i.e., noted the color printing as discussed in col. 9, lines 60+ of Pham '960;

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and noted the sensitivity of the photosensitive sheets values as discussed in col. 6, lines 5+ and col. 13, lines 55+ of Murayama '700).

Regarding claim 4, the combination of Pham '960 and Murayama '700 discloses wherein the lighting time lengths of the individual light emitting elements are changed proportionally to the tonal levels of the pixels to print (i.e., noted from Fig. 8 that the gray levels is proportional to the lighting time lengths of the exposure time; see col. 6, lines 40+ of Pham '960; see Figs. 10-11 and col. 18, lines 5+ of Murayama '700), whereas the luminance of the light emitting elements are changed with time for recording each pixel according to a non-linear curve that is determined by the lighting time lengths for the individual tonal levels (i.e., noted from Figs. 4-7 and 9 that the luminance of the LED elements are changed with the exposure time for recording each pixel based on the non-linear curve that is determined by the lighting time lengths for the individual tonal levels; see col. 5, lines 55+, col. 7, lines 6+ of Pham '960) and coloring characteristics of the photosensitive recording medium (i.e., noted the coloring characteristics as discussed in col. 9, lines 60+ of Pham '960).

Regarding claim 6, the combination of Pham '960 and Murayama '700 discloses wherein the light emitting elements (i.e., the LED array 20 of Pham '960) are driven a number N of times of a constant unit time (i.e., noted that the clock 19 provides a constant unit time; see col. 6, lines 49+ and Fig. 8 of Pham '960) for recording each pixel, the number N being '0' or an positive integer and varied depending upon the tonal level of the pixel to print (i.e., noted that the exposure times for gray level No. 1 is assigned a value "0" through "6"; see col. 6, lines 40+ of Pham '960), to control the lighting time lengths (i.e., noted the control steps for controlling the exposure time lengths as shown in Figs. 4-9 of Pham '960).

Regarding claim 10, the combination of Pham '960 and Murayama '700 discloses (in Fig. 9 of Pham '960 and Figs. 10-11 of Murayama '700) wherein the luminance (brightness) of the light emitting elements (LEDs) is varied (i.e., noted from Fig. 9, that the brightness level of the LEDs is varied by using the brightest of the LEDs "B" for recording a gray level No. 1 dot and using the weakest of the LEDs "W" for recording a gray level No. 15 as discussed in Pham '960; and also noted the varying of exposure as taught by Murayama '700; see col. 10, lines 5+) during an exposure time (i.e., noted the "EXPOSURE TIME" of 6-100 microsecond as discussed Pham '960; and also see col. 4, lines 55-68 of Murayama '700 for varying the brightness of the LEDs during the exposure time) for recording the pixels (i.e., see col. 8, lines 10-45 of Pham '960; and col. 5, lines 5+ of Murayama '700).

Regarding claim 5, the combination of Pham '960 and Murayama '700 discloses a printing head (i.e., Fig. 1, the element 10 of Pham '960; and printing head 15 as shown in Fig. 1 of Murayama '700) that has the plurality of light emitting elements (i.e., the LED array of Fig. 1 of Pham '960; and noted the LED array as shown in Figs. 1-4 & 6 of Murayama '700) aligned along a main scan direction (i.e., noted the LED array scan the recording medium 12 in the main scanning direction, e.g., across the medium 12, as shown in Fig. 1 of Pham '960; and noted the direction "X" as shown in Fig. 1 of Murayama '700), and the photosensitive recording material (i.e., the element 12 of Pham '960; and the element 1 of Murayama '700) relative to each other in a such scan direction (i.e., the direction shown by the arrow in Fig. 1 of Pham '960; and noted the Y direction as shown in Fig. 1 of Murayama '700) perpendicular to the main scan direction, for recording the image line by line (i.e., col. 3, lines 5-10 of Pham '960 of Pham '960; and noted



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from Fig. 1 of Murayama '700, the sub scanning direction "Y" is perpendicular to the main scan direction "X").

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Murayama '700 as discussed above and further in view of Masubuchi et al. (U.S. 6,262,757).

Regarding claim 2, the combination of Pham '960 and Murayama '700 discloses the luminance of the respective light emitting elements (i.e., noted the LED elements as shown in Figs. 1 and 2 of Pham '960; and Figs. 3-4, 6 and 10-11 of Murayama '700) is raised as the lighting time (i.e., the exposure time) for each pixel elapses (i.e., see Figs. 3-9; col. 7, lines 50+, col. 8, lines 5+ and col. 9, lines 30+ of Pham '960; and Figs. 10-11 of Murayama '700).

Further, it is noted that although Pham '960 shows the use of the photosensitive recording medium (12), Pham '960 does not explicitly state that the recording medium (12) is a self-developing type photo film unit as claimed.

However, the above-mentioned claimed limitations are well-known in the art as evidenced by Masubuchi '757. In particular, Masubuchi '757 teaches that it is conventionally well known to use a self-developing type photo film unit (i.e., col. 1, lines 25+) which producing photographs shortly after the photosensitive medium has been exposed so that the delay between image acquisition and viewing the print is reasonably shot.

In view of the above, having the system of Pham '960 and then given the well-established teaching of Masubuchi '757, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Masubuchi

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'757, and such a modification would obviously allow for immediate preview of an acquired image thereof.

5. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Murayama et al. (U.S. 6,130,700)

Regarding claim 7, Pham '960 discloses an optical printer (Figs. 1 and 2) for printing a grayscale image on a photosensitive recording medium (12) based on image data (i.e., col. 3, lines 3+), the optical printer comprising:

a printing head (i.e., Figs. 1 and 2, the element's 10) having a plurality of light emitting elements (i.e., the LED array) arranged in a main scan direction (i.e., the elements 10 and 20 of the LED array arranged in the main scan direction as shown in Fig. 1), for projections light beams towards the photosensitive recording medium (12);

a driving device for driving the light emitting elements (i.e., noted that the LED array are droved by the driver 23 as shown in Fig. 2; see col. 4, lines 15+) while controlling time lengths (i.e., noted the controlling time lengths as shown in Fig. 3) of driving the individual light emitting elements per each pixel in accordance with tonal levels of pixels to print that are represented by the image data (i.e., see figs. 3-9; col. 4, lines 25+, col. 5, lines 1+ and col. 8, lines 5+); and control device (i.e., 33) for controlling the light emitting elements (LED 20) according a predetermined characteristic curve (i.e., note the curves as shown in Figs. 4-9 respectively) as driving time for each pixel elapses (i.e., noted the exposure time for each dot as shown in Figs. 4-9).

Furthermore, it is noted that although Pham '960 discloses wherein the printing head is capable of scanning the photosensitive recording medium (12) in the main direction for recording each line of image on the photosensitive recording medium by using a predetermined characteristic curve as the deriving time for each pixel (i.e., each dot) elapses, Pham '960 does not explicitly show a control device for *changing luminance of the light emitting elements according a predetermined characteristics curve as the driving time for each pixel elapses*; and a device for *shifting the printing head (10) relative to the photosensitive recording medium in a sub scan direction* perpendicular to the main scan direction after each line of the image is recorded on the photosensitive recording medium.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Murayama '700. In particular, Murayama '700 teaches that it is conventionally well known in the art to use a scanning device (Fig. 1) for *shifting the printing head (15) relative to the photosensitive recording medium (1) in a sub scan direction* perpendicular to the main scan direction (i.e., noted the scanning directions "X" and "Y" as shown in Fig. 1) after each line of the image is recorded on the photosensitive recording medium (3), and changing luminance of the light emitting elements according a predetermined characteristics curve (i.e., Fig. 11) as the driving time for each pixel elapses (i.e., see col. 4, lines 55-68, col. 18, lines 5-25 and Figs. 4, 6, 10 and 11; the brightness for the light emitting elements LED1-LED4 is changed by varying the exposure duration by a different levels based on the lower two bits of the gradation data during the exposure time) so that it would prevent uneven color development in a printed image and therefore prevents deterioration of image quality (i.e., see col. 19, lines 10-15).

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In view of the above, having the system of Pham '960 and then given the well-established teaching of Murayama '700, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system of Pham '960 varying the brightness for the light emitting elements during the exposure time as taught by Murayama '700, since Murayama '700 stated in col. 19, lines 10+ such a modification would prevent uneven color development in a printed image and therefore prevents deterioration of image quality.

Regarding claim 11, the combination of Pham '960 and Murayama '700 discloses (in Fig. 9 of Pham '960 and Figs. 10-11 of Murayama '700) wherein the luminance (brightness) of the light emitting elements (LEDs) is varied (i.e., noted from Fig. 9, that the brightness level of the LEDs is varied by using the brightest of the LEDs "B" for recording a gray level No. 1 dot and using the weakest of the LEDs "W" for recording a gray level No. 15 as discussed in Pham '960; and also noted the varying of exposure as taught by Murayama '700; see col. 10, lines 5+) during an exposure time (i.e., noted the "EXPOSURE TIME" of 6-100 microsecond as discussed Pham '960; and also see col. 4, lines 55-68 of Murayama '700 for varying the brightness of the LEDs during the exposure time) for printing the pixels (i.e., see col. 8, lines 10-45 of Pham '960; and noted the printing multi-gradation images as discussed in Figs. 10 and 11 of Murayama '700).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Murayama '700 as discussed above and further in view of Nakatani (U.S. 6,373,514).

Regarding claim 8, the combination of Pham '960 and Murayama '700 discloses wherein luminance of the light emitting element (i.e., the LED elements 20a-20n) is variable depending upon drive voltage applied thereto (i.e., noted from Fig. 2 of Pham '960 that the light emitting of the LED is variable upon drive voltage applied thereto by adjusting the resistor; see col. 4, lines 40+; and see col. 4, lines 55+ and col. 10, lines 1-10 of Murayama '700), and the control device (31) controls the drive voltage (i.e., see col. 4, lines 25+ of Pham '960; and see col. 4, lines 55+ and col. 10, lines 1-10 of Murayama '700) according the predetermined characteristic curve (i.e., noted from Figs. 4-9 of Pham '960 that the drive voltage must be adjusted as the driving time for the exposure time changes; and noted the curve as shown in Fig. 11 of Murayama '700) as the driving time for each pixel elapses (i.e., see Figs. 4-9; col. 4, lines 25+, col. 7, lines 20+ and col. 8, lines 1+ of Pham '960; and col. 10, lines 2+ of Murayama '700).

Further, it is noted that Pham '960 does not explicitly state wherein the printing head is a fluorescent display panel that contains an array of the light emitting elements.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Nakatani '514. In particular, Nakatani '514 teaches that it is conventionally well known in the art to use the printing head (60) which is a fluorescent display panel that contains an array of the light emitting elements (Fig. 1, 3 and 6; col. 4, lines 55+) so that the light emission condition of each luminous element may be readily grasped with accuracy by controlling the drive voltage applied thereto by the control device (i.e., see Fig. 10; col. 3, lines 10+, col. 5, lines 20+ and col. 10, lines 40+).

In view of the above, having the system of Pham '960 and then given the well-established teaching of Nakatani '514, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Nakatani '514 so that the light emission condition of each luminous element may be readily grasped with accuracy as suggested by Nakatani '514 (i.e., see col. 3, lines 10+).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Murayama '700 and Nakatani (U.S. 6,373,514) as discussed above and further in view of Masubuchi et al. (U.S. 6,262,757).

Regarding claim 9, although the combination of Pham '960, Murayama '700 and Nakatani '514 show the control device (i.e., Fig. 2, the element 31; and Fig. 10, the element 7) raises the drive voltage as the driving time for each pixel elapses (i.e., see Figs. 4-9 and col. 4, lines 35+, col. 8, lines 1+ of Pham '960; and col. 5, lines 20+, col. 10, lines 40+ of Nakatani '514; and see col. 4, lines 55+ and *col. 10, lines 1-10 of Murayama '700 for varying the drive voltage of the LEDs*), the combination of Pham '960, Murayama '700 and Nakatani '514 does not explicitly stated wherein the photosensitive recording medium is a self-developing type photo film unit.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Masubuchi '757. In particular, Masubuchi '757 teaches that it is conventionally well known to use a self-developing type photo film unit (i.e., col. 1, lines 25+) which producing photographs shortly after the photosensitive medium has been exposed so that the delay between image acquisition and viewing the print is reasonably shot.

In view of the above, having the system of Pham '960 and then given the well-established teaching of Masubuchi '757, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Masubuchi '757, and such a modification would obviously allow for immediate preview of an acquired image thereof.

***Allowable Subject Matter***

7. Claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

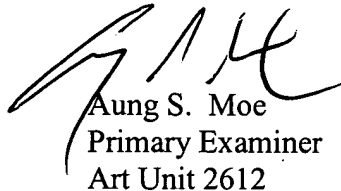
a. Fujita '355 shows an optical writing device changing luminance as the light time for each pixel elapses (i.e., see Figs. 3-11).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 571-272-7314. The examiner can normally be reached on Mon-Fri (9-5).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 571-272-7308. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Aung S. Moe  
Primary Examiner  
Art Unit 2612

A. Moe  
June 17, 2005